

What is claimed is:

1. An individual, end-sealed packaging bag formed from a sheet of a heat-shrinkable film, said sheet of a heat-shrinkable film having a first side, an opposing second side, an inner surface and an outer surface, said bag comprising:

5           a first seal connecting said first side to said second side and defining a tube member having a first bag wall, a second bag wall, opposing first and second bag edges, an end and an open mouth opposite said end;

          a second seal provided through said first and second bag walls, said second seal extending laterally across the width of both said first and second bag walls at a position proximate said end,  
10       whereby an empty product receiving chamber is defined by said first bag wall, said second bag wall, said second seal and said open mouth; and,

          wherein at least one of said first and second seals comprising a peelable seal.

2. The bag according to claim 1, wherein said first seal is selected from the group consisting of a lap seal, a fin seal, a butt-seal and a seal strip and said first seal comprises a  
15       peelable seal.

3. The bag according to claim 1, wherein said first seal comprises a butt-seal, said butt-seal including a butt-seal tape having a first border and a second border, a first heat seal joining said first border to said first side, and a second heat seal joining said second border to said  
second side.

20       4. The bag according to claim 3, wherein said first and second heat seals are peelable.

5. The bag according to claim 4, wherein said butt-seal tape comprises a butt-seal film including a peelable system.

6. The bag according to claim 4, wherein said sheet of heat-shrinkable film includes a peelable system.

7. The bag according to claim 3, wherein said butt-seal tape includes a pull flap.

8. The bag according to claim 3, wherein said first border is heat sealed to the inner surface of said first side and said second border is heat sealed to the inner surface of said second side.

9. The bag according to claim 8, wherein at least one of said first and second sides extends outwardly to form a pull flap.

10. The bag according to claim 2, wherein said first seal includes a seal strip, said seal strip comprising a strip film having a first margin, a second margin, an inside surface and an outward surface; a first heat seal joining said outward surface of said first margin to said inner surface of said first side; and a second heat seal joining said inside surface of said strip film to said outer surface of said second side.

11. The bag according to claim 10, wherein said second heat seal is a peelable seal.

12. The bag according to claim 10, wherein said first heat seal is a peelable seal.

13. The bag according to claim 10, wherein said strip film comprises a peelable system.

14. The bag according to claim 10, wherein said sheet of heat-shrinkable film includes a peelable system.

15. The bag according to claim 10, wherein said strip film includes a pull flap.

16. The bag according to claim 1, wherein said film comprises a multilayer barrier film.

17. The bag according to claim 16, wherein said multilayer barrier film comprises:

(a) an inner heat sealing layer;

(b) a barrier layer;

(c) a core layer;

5 (d) a tie layer; and,

(e) an outer heat sealing layer.

18. The bag according to claim 17, wherein said first seal is peelable and has a seal strength of less than 2 kilograms for a one inch strip.

10 19. The bag according to claim 17, wherein said first seal is peelable and has a seal strength of less than 1.5 kilograms for a one inch strip.

20. The bag according to claim 17, wherein said second seal is peelable and has a seal strength of about 500 to about 1000 grams for a one inch strip.

21. The bag according to claim 17, wherein said outer heat sealing layer forms the outer surface of said bag.

15 22. The bag according to claim 17, wherein said tie layer is permanently bonded to said core layer and peelably bonded to said outer heat sealing layer.

23. The bag according to claim 17, wherein said tie layer is permanently bonded to said outer heat sealing layer and peelably bonded to said core layer.

20 24. The bag according to claim 17, wherein said tie layer comprises a blend of polybutylene and at least one other constituent.

25. The bag according to claim 24, wherein said at least one other constituent comprises polyethylene.

26. The bag according to claim 17, wherein said outer heat sealing layer comprises polyethylene.

27. The bag according to claim 17, wherein said core layer comprises a blend of polyethylene and an ethylene-vinyl acetate copolymer.

5           28. The bag according to claim 17, wherein said barrier layer is selected from the group consisting of vinylidene chloride copolymers, ethylene vinyl alcohol copolymers, polyacrylonitriles and polyamides.

29. The bag according to claim 28, wherein said barrier layer comprises a vinylidene chloride copolymer.

10           30. The bag according to claim 17, wherein said inner heat sealing layer comprises a blend of polyethylene and ethylene-vinyl acetate copolymer.

31. The bag according to claim 17, wherein said tie layer comprises a blend of polybutylene and at least one other constituent; said outer heat sealing layer comprises polyethylene; said core layer comprises a blend of polyethylene and an ethylene-vinyl acetate  
15 copolymer; said barrier layer comprises a vinylidene chloride copolymer; and said inner heat sealing layer comprises a blend of polyethylene and ethylene-vinyl acetate copolymer.

32. The bag according to claim 31, wherein said at least one other constituent comprises polyethylene and said barrier layer comprises a blend of vinylidene chloride-methyl acrylate copolymer and vinylidene chloride-vinyl chloride copolymer.

20

33. The bag according to claim 17, wherein said inner heat sealing layer comprises from about \_\_\_\_ to about \_\_\_\_ %, said barrier layer comprises about \_\_\_\_ to about \_\_\_\_%; said core layer comprises about \_\_\_\_ to about \_\_\_\_%; said tie layer comprises about \_\_\_\_ to about \_\_\_\_%; and said outer heat sealing layer comprises about \_\_\_\_ to about \_\_\_\_%, based on the total thickness of said film.

34. The bag according to claim 1, wherein said second seal is nonpeelable.

35. The bag according to claim 1, wherein said sheet of heat-shrinkable film has a thickness from about 1.25 mil to about 8.0 mil.

36. The bag according to claim 30, wherein said sheet of heat-shrinkable film has a thickness from about 1.75 mil to about 3.0 mil.

37. The bag according to claim 1, wherein said sheet of heat-shrinkable film comprises a biaxially stretched film having a shrinkage value of at least 20% shrink at 90°C in at least one direction.

38. The bag according to claim 37, wherein said shrinkage value is in the machine direction.

39. The bag according to claim 37, wherein said shrinkage value is in the transverse direction.

40. The bag according to claim 37, wherein said shrinkage value is in both the machine direction and the transverse direction.

41. The bag according to claim 17, wherein said first seal comprises a lap seal and said inner heat sealing layer forms the inside surface of the bag.

42. The bag according to claim 1, wherein said first seal comprises a lap seal and said first side includes an unsealed portion extending outwardly beyond said first seal.

43. An end-sealed packaging bag formed from a sheet of a heat-shrinkable film, said film having a first side and an opposing second side, said bag comprising:

5 a first seal bonding said first side and said second side along the lengths thereof thereby defining a tube member having a first bag wall, a second bag wall, opposing first and second bag edges, an end and an open mouth, said first seal comprising a lap seal and being peelable;

a second seal provided through said first and second walls, said second seal extending laterally across the width of both said first and second walls at a position approximate said end;

10 and,

a product receiving chamber defined by said first wall, said second wall, said second seal and said open mouth.

44. A method of forming an end-sealed, heat-shrinkable packaging bag having at least one peelable seal from a flat sheet of film comprising:

15 (a) providing a sheet of heat-shrinkable thermoplastic film having a first side and an opposed second side;

(b) providing a first seal between said first and second sides to form a tube member, said tube member having a first bag wall, a second bag wall, a bottom and an open mouth; and,

20 (c) providing a second seal through said first and second bag walls, said second seal extending laterally across said tube member at a position approximate said bottom; wherein at least one of said first and second seals comprise a peelable seal.

45. The method according to claim 44, wherein said sheet of heat-shrinkable thermoplastic film is slit to a desired width prior to bringing said first and second sides together.

46. The method according to claim 44, wherein said sheet of heat-shrinkable thermoplastic film has a shrinkage value of at least 20% at 90°C in at least one direction.

5 47. The method of claim 44, wherein said sheet of heat-shrinkable thermoplastic film comprises a continuous roll of film sheet and said method further includes (f) providing a cut laterally through said tube member, said cut extending laterally across at least the width of both said first and second bag walls thereby separating a portion of said tube member including said second seal from said tube member.

10 48. The method according to claim 44, wherein said heat-shrinkable thermoplastic film is formed by coextruding a primary film tube, cooling the primary film tube, collapsing the primary film tube, inflating the primary tube, reheating the inflated primary film tube, biaxially stretching the primary film tube, cooling and recollapsing the primary film tube, slitting the primary film tube longitudinally and laying open the slit primary tube to produce a flat sheet of biaxially oriented film.

15 49. A method of forming a heat-shrinkable bag comprising the steps of:

(a) coextruding a primary film tube;

(b) biaxially stretching said film tube to provide a heat-shrinkable film tube stock;

(c) slitting said tube stock to form a continuous flat sheet of film;

20 (d) slitting said continuous flat sheet of film longitudinally to form a desired-width bag film; said desired-width bag film having a first side and an opposing second side;

(e) providing a first seal between said first and second sides to form a tube member having a first bag wall, a second bag wall and a product receiving chamber defined between said first and second bag walls, said first seal comprising a peelable seal;

5 (f) providing a second seal between said first and second walls, said second seal extending laterally across the width of said tube member and being a permanent seal; and

(g) providing a cut through said tube member, said cut extending laterally across the width of said tube member and separating a portion of said tube member  
10 containing said lateral seal from said tube member.

50. An end-sealed packaging bag formed from a sheet of a heat-shrinkable film, said film having a first side, an opposing second side, an inner surface and an outer surface, said bag comprising:

a first seal joining said first side and said second side along the lengths thereof and  
15 defining a tube member having a first bag wall, a second bag wall, opposing first and second bag edges, an end and an open mouth, said first seal comprising a lap seal and being peelable;

a second seal provided through said first and second walls, said second seal extending laterally across the width of both said first and second walls at a position approximate said end;  
and,

20 a product receiving chamber defined by said first wall, said second wall, said second seal and said open mouth.

51. The bag according to claim 50, wherein said film comprises a multilayer barrier film.

52. The bag according to claim 50, wherein said film comprises a multilayer barrier film comprising:

- (a) an inner heat sealing layer;
- (b) a barrier layer adjacent said inner heat sealing layer;
- 5 (c) a core layer adjacent said barrier layer;
- (d) a tie layer adjacent said core layer; and,
- (e) an outer heat sealing layer adjacent said tie layer.

53. The bag according to claim 52, wherein said tie layer comprises a blend of polybutylene and at least one other constituent.

10 54. The bag according to claim 52, wherein said at least one other constituent comprises polyethylene.

55. The bag according to claim 52, wherein said outer heat sealing layer comprises polyethylene.

15 56. The bag according to claim 52, wherein said core layer comprises a blend of polyethylene and an ethylene-vinyl acetate copolymer.

57. The bag according to claim 52, wherein said barrier layer is selected from the group consisting of vinylidene chloride copolymers, ethylene vinyl alcohol copolymers, polyacrylonitriles and polyamides.

20 58. The bag according to claim 57, wherein said barrier layer comprises a vinylidene chloride copolymer.

59. The bag according to claim 52, wherein said inner heat sealing layer comprises a blend of polyethylene and ethylene-vinyl acetate copolymer.

/

60. The bag according to claim 52, wherein said tie layer comprises a blend of polybutylene and at least one other constituent; said outer heat sealing layer comprises polyethylene; said core layer comprises a blend of polyethylene and an ethylene-vinyl acetate copolymer; said barrier layer comprises a vinylidene chloride copolymer; and said inner heat sealing layer comprises a blend of polyethylene and ethylene-vinyl acetate copolymer.

61. The bag according to claim 60, wherein said at least one other constituent comprises polyethylene and said barrier layer comprises a blend of vinylidene chloride-methyl acrylate copolymer and vinylidene chloride-vinyl chloride copolymer.

62. The bag according to claim 52, wherein said inner heat sealing layer comprises from about \_\_\_\_ to about \_\_\_\_ %, said barrier layer comprises about \_\_\_\_ to about \_\_\_\_%; said core layer comprises about \_\_\_\_ to about \_\_\_\_%; said tie layer comprises about \_\_\_\_ to about \_\_\_\_%; and said outer heat sealing layer comprises about \_\_\_\_ to about \_\_\_\_%, based on the total thickness of said film.

63. The bag according to claim 1, wherein said second seal is nonpeelable.

64. The bag according to claim 50, wherein said first seal has a seal strength of greater than 3 kilograms per inch.

65. The bag according to claim 50, wherein said first seal has a seal strength of greater than 6 kilograms per inch.

66. The bag according to claim 50, wherein said second seal has a seal strength of greater than 3 kilograms per inch.

67. The bag according to claim 52, wherein said outer heat sealing layer forms the outer surface of said bag.

68. The bag according to claim 52, wherein said tie layer is permanently bonded to said core layer and peelably bonded to said outer heat sealing layer.

69. The bag according to claim 52, wherein said tie layer is permanently bonded to said outer heat sealing layer and peelably bonded to said core layer.